Claims

What is claimed is:

1. A method for the diagnosis of pathological states or predispositions thereto based on lipid measurement parameter modulation/effector quotient profiles, comprising the steps of:

   (a) providing a sample from an organism to be investigated and dividing the sample into a plurality of sufficient equal part-samples to allow for measurement of a plurality of values for each of a plurality of lipid measurement parameters A, B, C, ...;

   (b) measuring a plurality of zero values A_0, B_0, C_0, ... in the absence of a modulating effector; measuring a plurality of indicator values A_{max}, B_{max}, C_{max}, ... in the presence of a modulating effector or an indicator substance; and measuring a plurality of values for a further modulation A_2, B_2, C_2, ... in the presence of a further modulating effector;

   (c) calculating a plurality of quotients of the measurements A_{max}/A_0, A_2/A_0; $B_{max}B_0$, B_2/B_0; C_{max}/C_0, C_2/C_0; ... for each lipid measurement parameter A, B, C, ... of the sample from the organism to be investigated; and dividing the quotients by the corresponding values of one or more standard group(s), resulting in standardized modulation quotients which in their totality form a standardized modulation quotient profile for the organism to be investigated;

(d) calculating a plurality of quotients A_0/B_0, B_0/A_0, A_0/C_0, C_0/A_0, B_0/C_0, C_0/B_0 ... in any combination from the zero values A_0, B_0, C_0 ...; and a plurality of quotients A_{max}/B_{max}, B_{max}/A_{max}, A_{max}/C_{max}, C_{max}/A_{max}, B_{max}/C_{max}, C_{max}/B_{max} ... in any combination from the indicator values A_{max}, B_{max}, C_{max} ...; and a plurality of quotients A_2/B_2, B_2/A_2, A_2/C_2, C_2/A_2, B_2/C_2, C_2/B_2 ... in any combination from the values for further modulation A_2, B_2, C_2 ...; and then dividing the values obtained for the organism to be investigated by a plurality of corresponding values obtained for one or more standard group(s)to obtain a plurality of standardized effector quotients which in their totality form a standardized effector quotient profile for the organism to be investigated; and

(e) diagnosing, confirming, or excluding a constellation of risk factors, a pathological state, or a predisposition thereto by comparing the standardized modulation quotient profile and the standardized effector quotient profile of the organism to be investigated with that of a corresponding investigation group in which the constellation of risk factors of interest, the pathological state, or the predisposition is present.

2. Method according to claim 1, wherein in step (a) said lipid measurement parameters are selected from the group consisting of measurement parameters for unsaturated fatty acids, degrading enzymes and synthesizing enzymes for unsaturated fatty acids, nucleic acids coding for degrading enzymes and synthesizing enzymes for

unsaturated fatty acids, receptors for unsaturated fatty acids, and nucleic acids coding for receptors for unsaturated fatty acids.

3. Method according to claim 2, wherein said unsaturated fatty acids are selected from the group consisting of platelet-activating factor and eicosanoids.

4. Method according to claim 3, wherein said eicosanoids are selected from the group consisting of peptide leukotrienes, prostaglandin E2, thromboxane A2 and thromboxane B2.

5. Method according to claim 1, where said modulating effector or indicating substance of step (b) is selected from the group consisting of arachidonic acid, chemotactic peptides, anti-IgE, lipopolysaccharide, and interleukin.

6. Method according to claim 1, wherein said further modulating effector used in step (a) is a substance which may cause a pathological state or is involved in the onset or development thereof.

7. Method according to claim 6, wherein said pathological state is selected from tumours, cystic fibrosis, polyposis, bronchial asthma, an intolerance, coagulation defects, overcoming of infection, and an inflammation.

8. Method according to claim 6, wherein said pathological state is inflammatory and neoplastic change of the gastrointestinal tract.

9. Method according to claim 6, wherein said intolerance is a food, food additive or drug intolerance or an allergy, or wherein said coagulation defects represent the basis for thromboses or haemorrhages or thrombophilia, or wherein said overcoming of infection is a resistance to bacterial or viral or mycotic elements, e.g. associated with bacterial, viral or mycotic mucositis, or wherein the inflammation is encephalitis, sinusitis, rhinitis, neurodermatitis, Crohn's disease or ulcerative colitis.

10. Method according to claim 9, wherein said drug intolerance is an analgesic intolerance or said allergy is a pollen, spore, mite, wasp or bee venom allergy.

11. Method according to claim 10, wherein said analgesic intolerance is intolerance of acetylsalicylic acid.

12. Method according to claim 1, where one or more, optionally labeled eicosanoid(s) or the dye 9-diethylamino-5H-[alpha]phenoxazin-5-one is/are used to determine the lipid measurement parameters.

13. Method according to claim 1, where immobilized probes are used to determine the lipid measurement parameters, and the immobilized probes are selected from the group consisting of antibodies or functional fragments thereof against degrading enzymes or synthesizing enzymes of unsaturated fatty acids or against receptors for unsaturated fatty acids, and nucleic acids which hybridize onto nucleic acids which code for degrading

enzymes or synthesizing enzymes of unsaturated fatty acids or for receptors for unsaturated fatty acids.

14. Method according to claim 13, wherein said antibodies are selected from the group consisting of polyclonal, monoclonal and single-chain antibodies, and said nucleic acids are selected from cDNA, mRNA and oligonucleotides.

15. Method according to claim 13, where the immobilized probes form an addressable pattern on a surface.

16. Method for monitoring the course of therapies of pathological states based on lipid measurement parameter modulation/effector quotient profiles, in which a method according to claim 1 is carried out after the administration or in the presence of a suitable medicament.

17. Method for finding active substances for the treatment of pathological states based on lipid measurement parameter modulation or effector quotient profiles, in which a method according to claim 1 is carried out after the administration or in the presence of a candidate active substance.

18. Method for finding substances able to induce a pathological state based on lipid measurement parameter modulation or effector quotient profiles, in which a method according to claims 1 is carried out after an administration/ application or in the presence of such a substance.

19. The method of claim 1, wherein said sample contains leukocytes.

20. The method of claim 1, wherein said lipid measurement parameters are selected from the group consisting of measurement parameters for ceramide; ceramide-1-phosphate; sphingosine; sphingosine-1-phosphate; phosphatidic acid; diacylglycerol; lysophosphatidic acid; the phosphatidylinositol phosphates; and enzymes modifying ceramide, ceramide-1-phosphate, sphingosine, sphingosine-1-phosphate, phosphatidic acid, diacylglycerol, lysophosphatidic acid, or the phosphatidylinositol phosphates.

21. An apparatus for obtaining lipid measurement parameter modulation or effector quotient profiles, comprising:

(e) means for providing a sample from an organism;

(f) means for measuring a plurality of values for each of a plurality of lipid measurement parameters A, B, C, ..., the means for measuring comprising:

i. means for measuring a plurality of zero values A_0, B_0, C_0, ... in the absence of a modulating effector;

ii. means for measuring a plurality of indicator values A_{max}, B_{max}, C_{max}, ..., in the presence of a modulating effector or an indicator substance; and

iii. means for measuring a plurality of values for a further modulation A_2, B_2, C_2, ... , in the presence of a further modulating effector;

(g) means for calculating, the calculating means comprising:

i. means for obtaining a standardized modulation quotient profile, comprising a plurality of standardized modulation quotients, by dividing plurality of quotients of the measurements A_{max}/A_0, A_2/A_0; $B_{max}B_0$, B_2/B_0; C_{max}/C_0, C_2/C_0; ... for each lipid measurement parameter A, B, C, ... of the sample from the organism to be investigated and dividing the quotients by the corresponding values of one or more standard group(s); and

ii. means for obtaining a standardized effector quotient profile, comprising a plurality of standardized effector quotients, by calculating a plurality of quotients A_0/B_0, B_0/A_0, A_0/C_0, C_0/A_0, B_0/C_0, C_0/B_0 ... in any combination from the zero values A_0, B_0, C_0 ...; and a plurality of quotients A_{max}/B_{max}, B_{max}/A_{max}, A_{max}/C_{max}, C_{max}/A_{max}, B_{max}/C_{max}, C_{max}/B_{max} ... in any combination from the indicator values A_{max}, B_{max}, C_{max} ...; and a plurality of quotients A_2/B_2, B_2/A_2, A_2/C_2, C_2/A_2, B_2/C_2, C_2/B_2 ... in any combination from the values for further modulation A_2, B_2, C_2 ...; and then dividing the values obtained for the organism to be investigated by a plurality of corresponding values obtained for one or more standard group(s); and

(h) means for comparing the standardized modulation quotient profile and the standardized effector quotient profile of the organism to be investigated with that of a corresponding investigation group.

22. The apparatus of claim 21, wherein one or more of said measuring means comprises a surface on which probes defined for determination of the lipid measurement parameters are immobilized, which probes are selected from the group consisting of antibodies or functional fragments thereof against degrading enzymes or synthesizing enzymes of unsaturated fatty acids, antibodies or functional fragments thereof against receptors for unsaturated fatty acids, and nucleic acids which hybridize onto nucleic acids which code for degrading enzymes or synthesizing enzymes of unsaturated fatty acids or for receptors for unsaturated fatty acids, wherein the antibodies are preferably selected from polyclonal, monoclonal and single-chain antibodies, and the nucleic acids are preferably selected from cDNA, mRNA and oligonucleotides.

23. The apparatus of claim 22, wherein the probes form an addressable pattern on the surface.